Aneurysm of the Abdominal Aorta

The Prognosis of the Condition if Untreated

EDWARD SHAPIRO, *M.D.*, Beverly Hills

• **In a study of the autopsies of 87 patients at Cedars of Lebanon and Los Angeles County General hospitals, it was noted that 38 had died from rupture of the aneurysm and 49 had died of unrelated diseases, the aneurysm being intact postmortem. At each age group from 50 to 85 years, just as many patients who had the lesion died from rupture of the aneurysm as from other causes.**

It was found that predisposing to rupture of the aneurysm was not the age of the patient, not hypertension, but definitely the size of the aneurysm. Aneurysms under 6 cm. in diameter (most are visible by x-ray) rarely ruptured.

ALTHOUGH ARTERIOSCLEROTIC ANEURYSM of the abdominal aorta is not common, the serious possibility of lethal rupture gives physicians constant concern about such a lesion. No one doubts the wisdom of surgical excision of a 10 cm. aneurysm in a vigorous man in his fifties or early sixties. However, with the general increase in longevity there is an increasing number of cases of abdominal aortic aneurysms in older people.[3] What attitude should be developed concerning these lesions in patients 70 years of age and older? What is the natural history of these aneurysms? What happens to patients not given the benefit of elective surgical treatment? Very few physicians see enough patients with aneurysms of this kind to gain first-hand experience.

MATERIAL

For answers to these questions study was made of the protocols of 87 patients who at autopsy were observed to have intact or ruptured arteriosclerotic aneurysms of the abdominal aorta. The protocols were taken from the files for the years 1948 to 1955 in order to embrace the era of increased longevity beginning with the advent of widespread use of antibiotics. A private hospital (Cedars of Lebanon) and a county hospital service (Los Angeles County) were used in an effort to balance economic and ethnic factors.

How valid are these data? Admittedly the series is small; however, the disease is not common. Since the diagnosis of abdominal aortic aneurysm, ruptured and intact, can be made by gross inspection, there can be no dispute about the presence or absence of the lesion. All the aneurysms in the cases studied originated below the renal arteries.

Is this series a fair representation of the disease in the population at large? Rupture of the aneurysm is a terrifying and painful incident which usually causes admittance to hospital. Many senescent persons with abdominal aortic aneurysm that does not rupture, however, die quietly at home of undramatic heart disease and strokes. Hence, this series, since it includes only patients who were admitted to hospital, may include a more than ordinate number of cases of rupture.

How long the aneurysm in each case had been present before death is impossible to estimate, since the lesions were observed postmortem. However, had the data been obtained from operative reports, it probably would be no better in this respect, for even the surgeon excising the aortic segment cannot tell how long it had existed. Every physician knows of an exceptional patient bearing an aneurysm for a decade or even longer.

RESULTS

Reports of a total of 87 cases were found in the records, in 38 of which the patient had died of rupture (Chart 1). In 49 cases intact aneurysms were observed incidentally and death had been brought about by unrelated causes. The difference between the two classes of hospital patients was insignificant. The ratio of men to women was about 4 to 1.

Do patients die of ruptured aneurysm at a significantly earlier age than patients with intact aneurysms? When the cases of ruptured and of intact aneurysms in this series were charted by age at death, the two curves were practically the same (Chart 2). Regardless of age, at least in Los Angeles County, a patient with an untreated abdominal aortic aneurysm has the identical statistical chance to die from an unrelated disease as from rupture of

From the Cedars of Lebanon Hospital and the University of Southern California School of Medicine Service at the Los Angeles County General Hospital.

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the lesion. Were it otherwise, the curves would appear as in the shaded area in Chart 2.

What, then, are the circumstances that increase the likelihood of death from rupture? While the likelihood of aneurysms developing increases as the patient ages, the prospect of death from other causes also increases. Although hypertension accelerates atherosclerosis in the heart, brain, retina and kidney, it seems not as significant a factor in causing aneurysm or increasing the propensity to rupture. Left ventricular hypertrophy and increased weight of the heart remain the only reliable verifications of essential hypertension of sufficient degree and duration to be considered a pathogenic influence. Blood pressure readings in aged persons are often unreliable owing to the widened pulse pressure disparity. Thickening of the left ventricle and increased heart weight were noted in 32 per cent of the cases of ruptured aneurysm and in 39 per cent of cases in which the patient died with intact aneurysm (Chart 3).

The size of the aneurysm is directly related to its propensity to rupture—the greater the size, the higher the incidence of rupture (Chart 4). Aneurysms less than 5 cm. in diameter in this series did not tear. How many months or years it takes for an aneurysm to grow from relatively safe to hazardous size is not yet known.

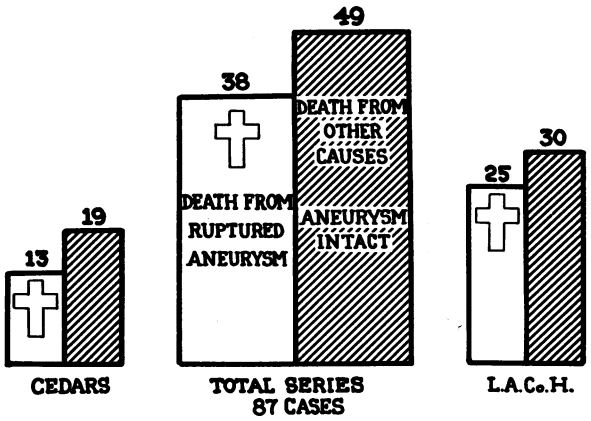

Chart 1.—Comparison of ruptured and intact aneurysms at autopsy.

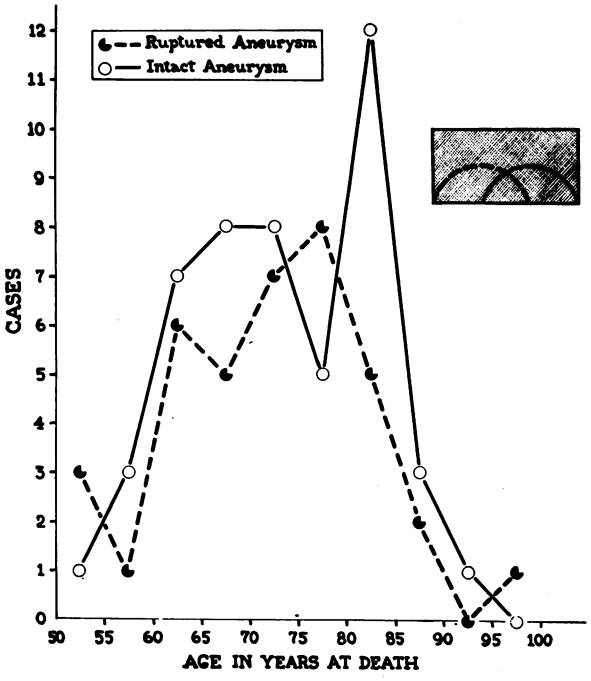

Chart 2.—Distribution of ruptured and intact aneurysms by age in hemidecades. Shaded inset shows how curves would appear if patients with ruptured aneurysms died earlier.

DISCUSSION

Wright[5] assayed the future of a patient with an abdominal aortic aneurysm as "comparable to many forms of cancer." He advised surgical resection and homograft as soon as the diagnosis was established if the patient were reasonably fit. Of 15 patients so treated, nine survived. De Bakey[2] said that the mortality rate in patients with unruptured aneurysm that he has operated upon of late is about 7 per cent, but that the rate increases with advancing age, hypertension and preexisting heart disease as complicating factors.

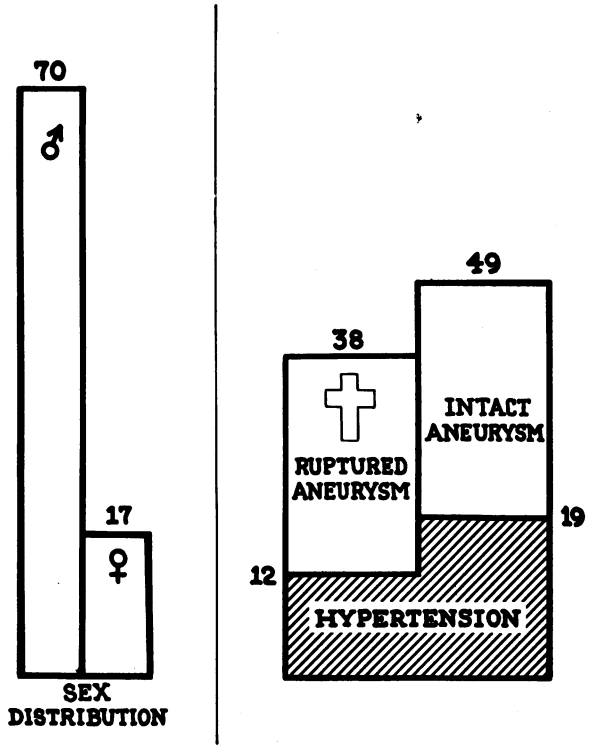

Chart 3.—Incidence of hypertension in ruptured and intact aneurysms.

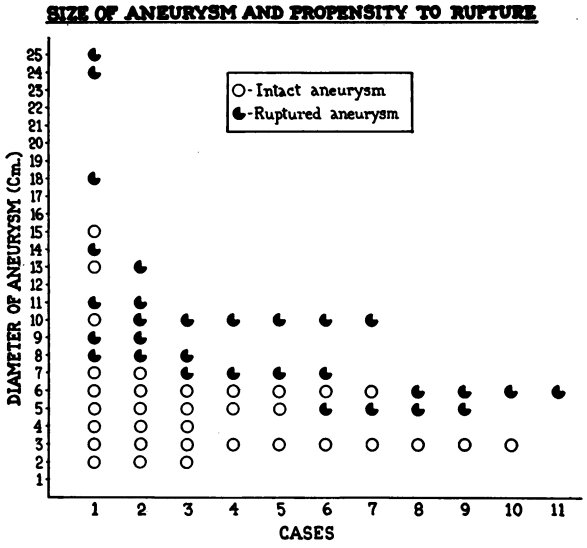

Chart 4.—Size of aneurysm and propensity to rupture.

Crane's[1] attitude appears, at this time, more logical: Once aneurysm is suspected from the expansile pulsation, the diagnosis can be established by plain and lateral radiographic exposures of the abdomen. Linear streaks of calcification or a soft tissue shadow will permit measurement of the diameter of the aneurysm in 86 per cent of the cases.[4] Because of the distance between the aneurysm and the film at 60 cm. tube-target distance, 15 per cent of the width should be subtracted. Small aneurysms—5 to 7 cm. or less in diameter—can be observed radiographically every three months. If calcification or a soft-tissue shadow is not visible, the diameter of the aneurysm can be roughly estimated by palpation and subtraction of the width of the panniculus. Growth of the aneurysm indicates a need for prompt surgical treatment.

Rules can never take the place of medical judgment. Younger patients with aneurysms of diameter greater than 5 cm. should be recommended for resection and graft. Older patients, especially those with severe coronary, cerebral or pedal atherosclerotic disease, should be watched carefully and warned about the seriousness of syncope and pain in the abdomen or back. Any abdominal aortic aneurysm, regardless of size, that causes symptoms merits immediate surgical treatment.

CONCLUSIONS

At any age, in Los Angeles County, there is an equal statistical chance that a patient with an abdominal aortic aneurysm will die of an unrelated disease as from rupture of the lesion.

Aneurysms less than 6 cm. in diameter rarely rupture. A conservative course of careful observation is justified in these cases.

In senescent patients with large aneurysms, the physician must rely on his judgment.

123 North San Vicente Boulevard, Beverly Hills.

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